Trees...

A National Journal

Chinese Elms in Amarillo, Texas, Pruned After Storm Damage (See Item Page 3)

POSSIBLE USE OF INSTRUMENTS IN DIAGNOSIS—*A. P. Beilman*

CANKER-STAIN DISEASE OF PLANE TREES —*P. V. Mook*

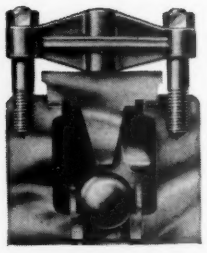
May-June, 1941 "PROTECT OUR FORESTS FROM FIRE" 25 Cents

Only BEAN is ROYAL Equipped!

There's no other pump like the BEAN Royal

HERE'S a spray pump that has kept pace with the demand for higher pressures without adding excessive weight. Simple in design...the working parts are enclosed in an extremely rugged nickel-iron crankcase and operate in a constant bath of oil. No grease cups ...no oil cups...and no dry bearings! Ball and roller bearings from end to end. Remember... only the BEAN Sprayer is equipped with the BEAN Royal Pump.

Talk with your nearest BEAN *dealer or write direct to us for complete* BEAN *catalog*



TROUBLE-LESS VALVES

BEAN *Stainless Steel Valves resist corrosion and pitting, can't stick or clog, and are easily replaced when worn.*

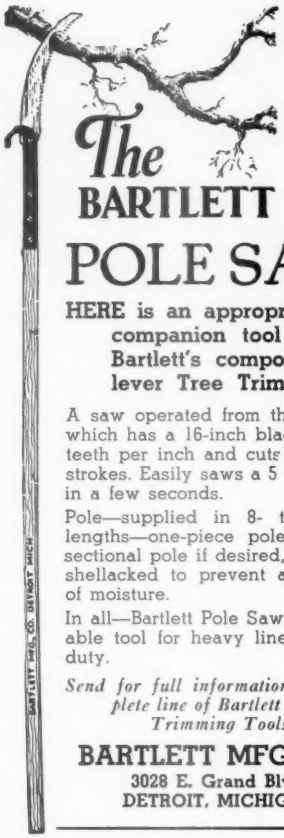
●

BEAN-CUTLER Division
Food Machinery Corporation
A consolidation of John Bean Mfg. Co. and Cutler Mfg. Co.
136 WEST JULIAN STREET · SAN JOSE, CALIFORNIA
Eastern Factory: Lansing, Michigan

● Authorized BEAN dealers in all important centers and readily available parts at many points insure good service & prompt service to BEAN owners everywhere.

FACTORY BRANCHES:
Portland, Oregon
Los Angeles, California
Wenatchee, Washington
Yakima, Washington

BEAN SPRAYERS ...Better ALL Ways



The BARTLETT POLE SAW

HERE is an appropriate companion tool for Bartlett's compound lever Tree Trimmer

A saw operated from the ground which has a 16-inch blade with 7 teeth per inch and cuts on down strokes. Easily saws a 5 inch limb in a few seconds.

Pole—supplied in 8- to 16-foot lengths—one-piece pole or with sectional pole if desired, carefully shellacked to prevent absorption of moisture.

In all—Bartlett Pole Saw is a durable tool for heavy line clearing duty.

Send for full information on complete line of Bartlett Tree Trimming Tools

BARTLETT MFG. CO.
3028 E. Grand Blvd.
DETROIT, MICHIGAN

THE TWIGGER

IMPROVED POLE SAW HEAD
A Permalawn Product

Embodies all the good and none of the bad of other pole saw heads.

List Price, $140. Discount to Tree Surgeons and Park Districts

ASK YOUR DEALER for
THE TWIGGER
Strong - Light - Durable
Featured before
THE SAFE-T-SEAT

Write for free catalog of Tree Surgery and Landscape Supplies

PERMALAWN PRODUCTS CO.
Evanston, Illinois

TREES Magazine is a bi-monthly Journal published at Santa Monica, California, by the Scanlon Publishing Company, and is devoted to the technical and business administration of Trees (Street and Ornamental); Parks (Municipal and National); and Forests (State, National and Private), in the U. S. Editorial and Business Address, 114 Santa Monica Boulevard, P. O. Box 886, Santa Monica, California. Telephone 54827. Subscription by mail, $1 per year. Advertising rates upon inquiry. Unsolicited manuscripts must be accompanied by postage return.

ALONG THE WAY

With . . .
EDW. SCANLON

■ DR. CURTIS MAY in sending the fine article by MR. P. V. MOOK, which is A FEATURE IN THIS ISSUE OF TREES, said: "The planetree disease seems to be a trouble that should be better understood by arborists and one which may demand considerable more attention in the future than it has in the past. The trouble is still spreading in the east and threatens the use of the tree as a street tree unless we devise methods for controlling it."

* * *

■ *The recent Annual Conference of the AMERICAN FORESTRY ASSOCIATION held in LOS ANGELES was very interesting, even though dominated by the hush-hush of great political goings-on. Met a fellow editor of another UP AND COMING magazine, OVID BUTLER of AMERICAN FORESTS.*

* * *

■ FRED HORNADAY, advertising manager of AMERICAN FORESTS, and I are the epitome of great minds. You know the channel stuff—we both think ADVERTISERS are TOO HARD TO GET. Yeah, but look at the BUSINESS THEY DON'T GET, FRED!

* * *

■ *Up pops BILL ERDMAN, out in OMAHA, Nebrasky, with A SAD TALE about the after-effects of the recent SERIOUS DROUGHT in them parts. It LOOKS LIKE CURTAINS for all of the CHINESE ELMS, WEEPING WILLIES and LOMBARDY POPLARS. A severe epidemic of Cytospora Chrysosperma has hit them. Not satisfied with that, a FIVE BELOW ZERO BLAST last November 11 struck and mortally injured FIFTY PERCENT OF THE CHERRIES and other fruit trees while still in leaf.*

* * *

■ As always when I am with him, I had an intensely interesting day with EMANUEL FRITZ, PROFESSOR OF FORESTRY AT THE UNIVERSITY OF CALIFORNIA. The occasion was the American Forestry Conference, and "mountain goat" CARL GERHARDY of the LOS ANGELES COUNTY FORESTRY DEPT. drove us half way to to the moon to see a SWELL EXHIBITION OF FIRE FIGHTING TECHNIQUE. Don't blame me, CARL!

* * *

■ *I sure got a SWELL RESPONSE to my appeal in the last issue for copies of CITY STREET TREE ORDINANCES. A grand total of NONE! What's the matter—am I LOSING MY SEX APPEAL? Come on, now, some of you city boys—BREAK DOWN!*

* * *

THE COVER PICTURE

On the cover of the January-February issue of TREES we showed the Chinese Elms on Washington Street in Amarillo, Texas, after the devastating ice storm of November 3, 1940 (story page 7, January-February issue).

Mr. C. H. Fitz, City Forester, has sent us the present picture showing the severe pruning job that was necessary to clear the broken mutilated tops. The trees in the background are American Elms.

■ Had quite a *CEREMONY IN PASADENA several weeks ago. PIERRE MILLER, PLANT PATHOLOGIST AT THE UNIVERSITY OF CALIFORNIA AT L. A., injected the FIRST LIVE OAK (Q. agrifolia) for control of Phytophthora cactorum. The "bridesmaids" were TED HOLDERNESS, CITY FORESTER of the home town; FRED ROEWEKAMP, LOS ANGELES CITY FORESTER; W. S. ROWLAND, ARBORIST OF ROWLAND & NEWHOUSE, and yours ALONG THE WAY, who DID THE GRUNTING for the workers.*

* * *

■ TED HOLDERNESS will probably slay the boys with a term he learned (so did we) from Pete Miller at the above ceremony. He will "fungistatic" everyone to death—wait and see!

* * *

■ *Several years ago in TOLEDO, CHARLEY CRAWFORD showed me a beautiful poplar in his yard. It is Populus Maximowiczii (wow!), Japanese poplar. This tree deserves more attention because of its VERY HANDSOME APPEARANCE and EXTREMELY FAST RATE OF GROWTH. If anyone has any INFORMATION REGARDING its OCCURRENCE AND CULTURE in various sections, will you please pass it on to TREES for PUBLICATION?*

* * *

■ May we URGE EVERY ARBORIST in the field to write in his experiences with CERTAIN PROBLEMS affecting trees. The particular fertilizer, amount and time of application MAY BE THE MEANS of pulling a fellow treeman OUT OF A HOLE. DON'T BE BASHFUL! Look back further and read the fine letter F. C. THOMAS of GREENSBORO, N. C., wrote. If the answer to his problem is found it can very easily GET HIM MORE BUSINESS and certainly a solution will give him PRESTIGE. Don't tell us you haven't some UNUSUAL OCCURRENCE in your practice.

* * *

■ *We're grateful to W. RAY HUNTER, FORESTER for the HYDRO-ELECTRIC POWER COMMISSION, ONTARIO, CANADA, for two fine articles that he authored on LINE CLEARING.*

* * *

■ Now it seems that URB THROM of the DAVEY COMPANY is collecting data on *Sequoia* trees growing in the Eastern United States. TREES is interested in this subject, URB, and hopes you will relay the dope. We'd LIKE TO PUBLISH IT for you.

* * *

■ *ED CONNELL, TREE WARDEN of STAMFORD, CONN., has sent us a copy of the recent SHADE TREE CENSUS for his town. Looks like a little uniformity might be in order, eh, ED?*

* * *

■ Ted Holderness, Mrs. Holderness and "A. T.W." stopped at DANA BOWERS' hacienda in Sacramento before going to the Western Shade Tree Conference in San Jose. D.B.'s much abused—better half was called away by a serious illness, so DB. COOKED THE GROCERIES. Gosh, if he only had BLUE EYES!

* * *

■ Why can't we DRUM UP some LETTER ACTIVITY from TREE MEN and PARK MEN regarding their EXPERIENCES in the TREATMENT of various TREE PROBLEMS? See in this issue, on PAGE 8, a section entitled "THE MAN IN THE FIELD REPORTS." We'd like to see this letter section spread to ONE or even FOUR PAGES. Come on, get in and PITCH! Just think of the GOOD that MIGHT REDOUND TO ALL ARBORISTS in North Carolina and vicinity if the trouble F. C. THOMAS reported is definitely classified. Let's have some LETTERS.

* * *

■ *S. W. Parmenter, Arborist, Kent, Ohio, says with a CARTOONED GRIN that with summer here he hopes his TELEPHONE will set up a constant buzz. We do too, chum.*

* * *

■ TREES will REALLY begin to serve the field of TREE PRESERVATION if you readers will support the column on page 8, "THE MAN IN THE FIELD REPORTS."

* * *

■ *BILL ERDMAN, the ENERGETIC Omaha Arborist, has sent me about THIRTY PAGES of clippings on the swell job the tree authorities are doing to make street trees MORE GREATLY APPRECIATED in Omaha. Park Commissioner RAY N. TOWL and City Forester FRANK J. PIPAL are the sparkplugs.*

* * *

■ Get that book of PAT PIRONE'S—"MAINTENANCE OF SHADE AND ORNAMENTAL TREES." It's only FOUR BUCKS FIFTY and WORTH TWICE that amount.

Save-the-Redwoods

Send 10 cents each for these attractively illustrated pamphlets: "A Living Link in History," by John C. Merriam ... "Trees, Shrubs and Flowers of the Redwood Region," by Willis L. Jepson ... "The Story Told by a Fallen Redwood," by Emanuel Fritz ... "Redwoods of the Past," by Ralph W. Chaney. All four pamphlets free to new members—send $2 for annual membership (or $10 for contributing membership).

SAVE-THE-REDWOODS LEAGUE
219 California Hall, University of California
Berkeley, California

WE HAVE
TOOLS and SUPPLIES
FOR YOUR EVERY NEED
listed and described in our
BLUE BOOK
Write for your free copy today

American Florist Supply Co.
Importers and Distributors
1335 W. Randolph St. Chicago

May-June, 1941 BI-MONTHLY Volume 4 — No. 3

EDWARD H. SCANLON, Editor
Editorial Office: 114 Santa Monica Boulevard, Santa Monica, California

"No place is complete without trees. A home without trees is charmless; a road without trees is shadeless; a park without trees is purposeless; *a country without trees is hopeless*"

ADVISORY COUNCIL

L. C. Chadwick
Assoc. Professor of Horticulture
Ohio State University, Columbus, O.

Gilbert L. Skutt
Supt. of Parks, Los Angeles, Calif.

A. Robert Thompson
Forester, National Park Service
Washington, D. C.

M. B. Pratt
State Forester, Sacramento, Calif.

Karl Dressel
Assoc. Prof. Forestry, Michigan State College
East Lansing, Mich.

L. Glenn Hall
Landscape Architect, San Francisco, Calif.

H. Dana Bowers
State Landscape Engineer
Sacramento, Calif.

Harold S. Newins
Director School of Forestry, University of Florida
Gainesville, Florida

Emanuel Fritz
Associate Professor of Forestry
University of California, Berkeley, Calif.

Charles F. Irish
Arborist, Cleveland, Ohio

P. P. Pirone
Assoc. Prof. Plant Path., Rutgers University
Research Specialist, N. J. Agri. Exp. Sta.

Dr. Donald Wyman
Horticulturist, Arnold Arboretum
Jamaica Plain, Mass.

Fred N. Evans
Supt. of Parks, Sacramento, Calif.

GEORGE T. DALTON
City Arboriculturist, Seattle, Washington

Dr. Leroy Abrams
Director, Natural History Museum,
Stanford University

Frank Herbert
Entomologist, San Francisco, Calif.

Ralph D. Cornell
Landscape Architect, Los Angeles, Calif.

CORDIALLY YOURS

CONVENTION ISSUE FOR AUGUST

Because TREES is the only National publication devoted entirely to Tree Preservation, it is, of course, its duty to help the advancement of the profession. The National Shade Tree Conference will hold its Seventeenth Annual meeting in Washington, D. C., August 26-29 this year, so for the first time in the history of the event a national magazine will be devoted entirely to the Conference.

The August issue of TREES will be the National Shade Tree Conference Issue and will contain much information regarding the Conference and its past for the information of arborists throughout the country who should be members.

A very interesting feature will be an historical picture of the Fourth Conference which coincidentally was also held in Washington. In the future, each year TREES will devote this issue to the Conference with the objective of a wider-spread and larger membership, and a closer bond of unity set up in the ranks of professional arborists.

THE FORK IN THE ROAD

For several years now the germ for the affiliation of the various shade tree conferences has been floating around and finally it seems that this all-important milestone may be accomplished this year.

The Western Shade Tree Conference, which has just completed its eighth annual meeting at San Jose, California, voted authority to its executive-secretary to take the necessary steps to effect this advancement. The Southern Shade Tree Conference at its meeting earlier in the season went on record favoring such a move and now the Executive Committee of the National Shade Tree Conference has tentatively set up a plan for the establishment of chapters or sections of that organization.

It is sincerely hoped that the National Shade Tree Conference at its August meeting will unanimously approve of the plan that will carry out the implications of its organization name and make it a truly National Shade Tree Conference.

We see so many professions with little groups spread here and there all over the country pulling against one another that we do not want this to happen to the profession of Arboriculture. This has not happened yet, but it could.

In our opinion the only way in which this can be obviated is through the adoption of the proposal now being formulated. By the very nature of our work we are what most people

would consider a non-essential economic group, and our work comes under the heading of a luxury. This makes our efforts to obtain worthwhile recognition for Arboriculture much more difficult, but by the same token, should spur us to much greater effort and encourage us to take advantage of every opening and opportunity to accomplish our ends. In other words, in union there is strength and only by a unified front, and we hope in a short time a national publicity campaign, will we be able to place tree preservation in the necessity category where it rightfully belongs.

The changes in the National Shade Tree Conference necessary to effect the affiliation of sectional and state groups is going to be a test of the *perspicacity, progressiveness, professional loyalty* and *organization fealty of each voting member* of the National Shade Tree Conference. Whether or not our profession and business takes this step on the road to national advancement and recognition is placed squarely on their shoulders. Knowing so many of these fine fellows personally, we cannot see anything but a vote to go ahead to greater accomplishments.

Liquid Latex (Protex) Spray Benefits Transplants

For many decades, nurserymen and park superintendents have covered their young stock during and after transplanting operations to offset drying out of the tissue and resulting permanent injury or death of the material.

Paraffin and vegetable waxes have been used to offset dehydration and excessive dessication, but the new liquid latex spray (Protex) combined with its other ingredients successfully prevents moisture loss, that deterrent to plant growth, and its other properties makes it well-nigh invaluable in eradicating such serious universal plant pests as San Jose scale, psylla eggs, European red mite, greenfly and other soft-bodied insects, as well as tending to prevent borer infestation or infection by bacteria or fungi.

Young nursery stock may be dipped or sprayed with equal facility with the liquid latex spray. Diluted at the rate of one part solution to two and a half parts water, the spray should be applied in the form of a fine mist with a hand or power sprayer the nozzle of which should be about two feet away from the plant and two sprayings, with thirty minutes between applications, is to be recommended so that thorough and complete covering is assured.

Spring spraying, during March or April when the temperature is above 32 deg. F., with the new spray is of the utmost importance.

OLD TREES STILL VIRILE

The same trees that provided maple syrup and sugar for his grandfather, Isaac Chase, of Turner, Maine, in 1820, the year Maine gained statehood, were tapped this year by Lester Chase. Chase now has more than 1000 maple trees in his orchard.

Tree Wrap for Bark Protection

Increasing steadily each year is the demand for the *Chase Spiral Tree Wrap,* according to J. M. Leonard of the Piqua, Ohio, firm of horticultural tool distributors, A. M. Leonard & Son.

This material, manufactured of a high grade craft paper, is crinkled so that in applying to the trunk of a tree it will adhere closely and firmly, is waterproof and, because of the asphaltum layer between the two outer surfaces of paper, is highly resistant to disintegration, making it effective for a long period of time.

Mr. Leonard informs that the four-inch width has been the most popular with arborists and nurserymen. However, the material also comes in three, four and six inch widths with rolls containing fifty-two yards. It is suggested that in applying the material for the protection of a tree trunk, it be started at the top and worked down. This permits rain to seep under the wrapping and keep the bark in a healthy moist condition.

An Offer of Help in Diagnosis

"Don't Plant Good Seeds in Soil Where They Will Not Grow" is the title of an interesting little booklet published by the Sudbury Soil Testing Laboratory, that is full of helpful suggestions about soil treatment and soil study and analysis. Detailed information about soils and fertilizers, and their application to turf and trees of every character are given in a way that will be helpful to all who are interested in improving soil and lawn conditions. Arborists, parkmen and nurserymen may have a copy of this interesting book free by addressing The Sudbury Soil Testing Laboratory, P. O. Box T 886, South Sudbury, Mass.

Laurel Replaces Briar for Pipes

HENDERSONVILLE (N. C.)—The collapse of France has given the mountaineers of western North Carolina a new industry.

Thousands of dollars weekly are being paid the mountaineers for laurel root, the best substitute for the French briar that pipe manufacturers have found in the United States.

JACOBSEN'S New Heavy Duty SCYTHE

● Stronger, sturdier and more powerful than ever before . . . that's the new and improved Jacobsen Heavy-Duty Motor Scythe. Power and more power is the answer to the ability of this tough, rough and ready unit to go and get weeds where the going is hardest. Its dependable 2 H.P. Jacobsen engine delivers a steady flow of two-fisted power . . . because of the surplus power it is an all-purpose year round unit—readily adaptable to multiple lawn mowing and snow plow work.

The heavy, reinforced frames are built to withstand the heaviest punishment. Used as a Weed Cutter, it wades into its job under all conditions, over uneven ground, along ditches and hillsides . . . clearing large areas of the heaviest weeds with ease, speed and economy. Auto-type differential and dual clutch control at the handle make the Jacobsen easy to operate around obstructions. The generous 48-inch sickle bar enables it to do the work of seven men with hand scythes . . . and to do it quicker, faster, better. Casing and inner tube tires are provided with seal-leak. Clipping as low as 1½ inches, as are high as 5½ inches, it tackles the toughest, tallest grass and the ugliest type of weeds . . . and really mows 'em down.

JACOBSEN MANUFACTURING CO. — RACINE, WIS.

DIAGNOSIS OF TREE DISORDERS (A New Series)

No. 2 — Possible Use of Instruments In Diagnosis

By AUGUST P. BEILMAN
Missouri Botanical Garden

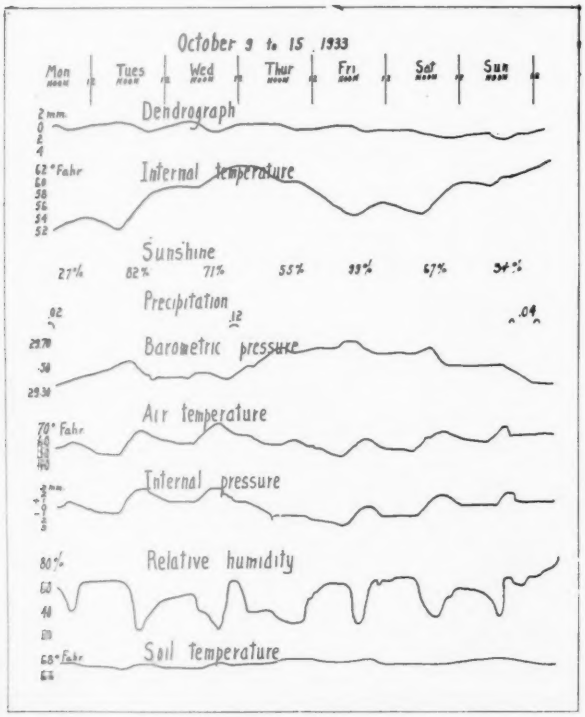
For some ten years the writer has been engaged in a critical study of the effects of the environment on the behavior of certain trees. From this work which began as an investigation of the gas pressures behind trunk cavities, certain instruments and techniques have been developed and these appear to have some diagnostic value.

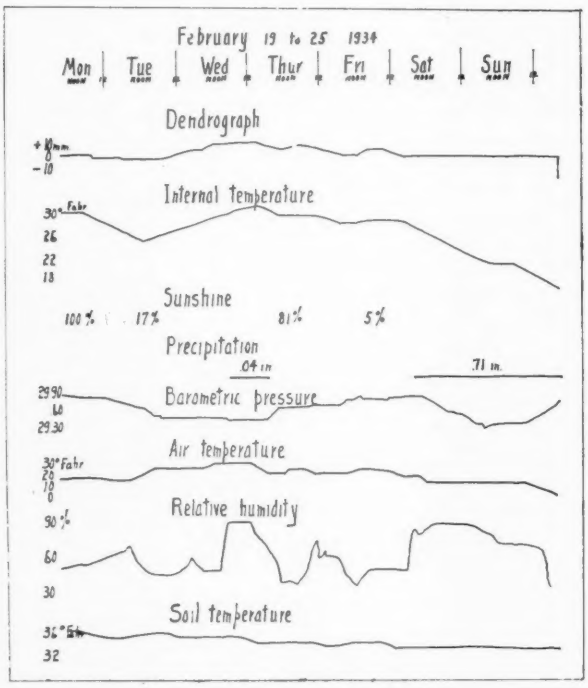
If we examine the usual procedure centering about an ailing shade tree, we must conclude that outside the fields of pathology and entomology, *diagnosis is on a par with the human medicine of the Middle Ages.* The environment which modifies the whole structure of a tree introduces the vast field of physiology; and here the only measurements are badly worn rule of thumb axioms. Any real improvement in the diagnostic procedure must come from some measurable quality of the inward processes of the tree.

The diagnosis of a tree made before the beginning of an operation should concern itself with a determination of the state of health of that tree. This does not mean that the fungi or the insects can be neglected. They may be of prime importance, or, they may be secondary and important only as indicators of what has happened to the tree. They must be controlled, but the future well being of the tree and the success of the contemplated work hinge upon measuring the decline in health, or more accurately, the extent of the departure from normal physiological activity.

If we could determine the state of health of a tree by observing its behavior during a portion of the growing season, we might never again learn of the death of a tree six months or so after an operation. Perhaps the dead tree had received extensive treatment. Since death followed the operation both the operator and his methods fall into disfavor. We know that trees do not die from shock after an operation; we also know that normal trees respond to modern methods of care. The operator, however, might be justly criticized for an imperfect diagnosis. To him the tree appeared normal, but actually it was so physiologically sub-normal that recovery was impossible. For instance, the tree whose roots have been killed by an earth fill may send forth a crop of leaves for several seasons—if the summers remain moist and cool. The river bank tree killed by submergence, or the girdled tree may under ideal conditions mature fruit and leaves for several years; provided ample food and water were stored in previous seasons. A superficial examination of such cases will often disclose symptoms of starvation. Obviously, feeding will not speed recovery. However, it is not necessary that the root system be killed before a tree is unfitted for an operation. Physiological activity may be so slight that there is little chance for survival regardless of what is done. The customary superficial examination of leaves, bark, branches, etc., does not furnish a basis for diagnosis in difficult cases, and in large trees these indicators are often misleading. Only through the use of certain instruments can we get a

(*Continued on page* 14)





See text for explanation of graphs

CANKER-STAIN DISEASE OF PLANETREES

By Paul V. Mook

Forest Pathology Field Laboratory
Bureau of Plant Industry
U. S. Dept. of Agriculture
Morristown, N. J.

There are four species of planetrees commonly growing in the United States. Three are native, *Platanus occidentalis, P. racemosa* and *P. wrightii.* The first, the American plane, or sycamore, has the greatest range and is widely distributed through the East. The more localized California plane and the Arizona plane are found in the West and Southwest, respectively. The remaining plane, commonly planted, is the introduced horticultural hybrid known as the London plane (*P. acerifolia*)—a popular tree for city planting. The London plane has been widely mistaken for another species,

Fig. 1. *Known distribution of the canker-disease of planes. Nov.* 1940 (*from map and photograph by W. D. Douglas*)

often mentioned but seldom planted and rarely found, the true Oriental plane (*P. orientalis*). In the United States all these trees are often known as sycamores.

Among the above species, arborists and all others interested in trees should be on the lookout for a destructive disease that has been especially severe on London planes in the East. In the vicinities of Philadelphia, Pa., Baltimore, Md., and Washington, D. C., the death of thousands of trees has resulted from this disease. The importance of the disease may be realized by considering the situation in one small industrial town in Pennsylvania, planted almost exclusively with London planes. Eight or ten years after the appearance of the disease, less than one-third of all the trees in the town remain healthy; the rest have either been killed or are now diseased.

At present, the disease has been found along the Atlantic coast from New York City to Magnolia, N. C., westward to central Kentucky, South Charleston, W. Va., and Vicksburg, Miss.—New York City and Vicksburg being the northern and southern limits, respectively. (Figure 1.)

Pennsylvania, New Jersey, Maryland, West Virginia, Delaware, Virginia and New York are the states having the greatest known numbers of infected trees. The disease has also been found in the District of Columbia.

OTHER HOSTS

The American plane is also susceptible. Diseased trees have been found in native stands west of Philadelphia and in the more sparsely settled mountainous regions of Virginia and West Virginia. About one-half of one per cent of the trees have been found infected in the limited tallies made in such environments. Diseased American planes were found at some of the places previously mentioned. Indications are that the American plane is less susceptible than the London plane. So far, the susceptibility of the California, Arizona and Oriental planes has not been determined. These species, however, are now being made available for testing their reactions to the disease, and it is hoped that information on this may be obtained in the near future.

CAUSE OF THE DISEASE

The cause of the disease is a fungus which probably will ultimately be described as a species of *Endoconidiophora.* This name includes a group of fungi recently delimited from a group called *Ceratostomella.* The planetree fungus has some interesting relatives. One species of the genus *Ceratostomella* is the cause of the destructive Dutch elm disease. Other close relatives cause such common diseases as the black rot of sweet potato, the bud rot of date palm, and several are responsible for various wood stains of both softwood and hardwood lumber.

NAME OF THE DISEASE

As two of the most distinctive characteristics of the disease on planes are (1) a canker on the trunks of infested

Fig. 3. *Trunk cankers on a nearly dead London plane. A cross section through such a region would show wood stain throughout most of cross-sectional area*

trees, and (2) a conspicuous wood stain which is readily seen when sections of infected trees are made, the disease has been named the "canker-stain disease of planes." The name is appropriate, as it not only contains words relating to the two most reliable symptoms of the disease, but it serves to separate this disease from other planetree troubles such as the common anthracnose.

SYMPTOMS

To the casual observer, perhaps the first noticeable symptom of diseased trees would be the thin, sparse, small-leaved, pale-green or yellowing foliage of badly diseased trees during the early summer, followed by more extensive yellowing, browning and dropping of leaves as the

(*Continued on page* 15)

Affiliation of Tree Conferences High Note of Western Meet

Fine weather and fine friends collaborated to bring President Ray Hartman's tenure of office to a close at the Eighth Western Shade Tree Conference in San Jose, Calif., on May 17.

Of the papers presented, it would be difficult to designate any one as the best. Perhaps the most vitally important current subject was the theme of the papers by Professor Pierre Miller of the University of California at Los Angeles, and Dr. Frank Howard of Rhode Island State College (who was unable to attend) on the recently classified fungus disorder of shade trees, "bleeding canker" (*Phytophthora cactorum*). Mr. Miller discussed the disease as it affects western trees (*Quercus agrifolia*) and Dr. Howard gave the symptoms, etc., and related the injection method he has employed for its control; his paper was beautifully illustrated by twenty-eight kodachrome slides.

C. F. "Ted" Holderness, City Arborist of Pasadena, Calif., who was elected president of the Ninth Western Shade Tree Conference.

Dr. E. O. Essig of the University of California, gave a highly entertaining and valuable lecture with slides, on the use of kodachrome slides in arboricultural work. More people are going to buy cameras!

Dr. Ralph H. Smith, also of U.C.L.A., presented a subject of great value to Arborists and Park men—"Recent Studies on the Control of Sycamore Scale." It, too, was illustrated.

Space does not permit discussion of the other papers that rounded out a well-balanced program.

Fred Roewekamp is sure of a place in the history of horticulture. As his contribution as chairman at the Friday luncheon, he presented the spell-bound audience with the "holy grail" of the tree world—a perfect tree! It neither sheds leaves, flowers or bark; needs no feeding, spraying or pruning; does not depend on soil or moisture, and is really attractive. It has two types of flowers, a large hibiscus-type in yellow and a blue locust-type. Dr. H. E. Burke was asked to classify this "thing" and he gave the following botanical name, *Pseudo phyton diabolicus innomiatum,* which means (we hope) "A Devil of a Bum Plant Without Any Name."

By all means the most important transaction of the business session was the unanimous vote of the conference authorizing the holdover executive-secretary, Edw. Scanlon, to work with officials of the National Shade Tree Conference in effecting an affiliation with that organization. Should this be accomplished, the conference would henceforth be known as the *National Shade Tree Conference (Western Section).* This is a highly desirable step and would mean that the Proceedings of all present groups, National, Western and Southern, would be published in one volume; there would be unity of action and purpose and in general Arboriculture should take a tremendous stride forward in public recognition. Unfortunately, a letter from Dr. L. C. Chadwick, secretary-treasurer of the National Shade Tree Conference, to the writer was received after adjournment; however, Dr. Chadwick indicated that the Executive Committee of the National Shade Tree Conference have gone into this affiliation thoroughly and with the approval of the Western and Southern groups it remains only for the National to effect this union.

At the annual banquet, Keith L. Davey, president of the Davey Tree Surgery Co., San Francisco, showed some very *touching* color movies of a trip he made recently to the island of Bali. A distinguished guest was the speaker of the evening, Dr. Willis Lyn Jepson, famous botanist from the University of California.

The conference voted to hold its ninth meeting at Long Beach in 1942 and elected Ted (C. F.) Holderness, City Arborist of Pasadena, president; Kenneth Wilson, Field Entomologist of the California Spray-Chemical Corp., vice-president; Dale Griggs, treasurer; and Edw. H. Scanlon, executive-secretary.

The Man In the Field Reports

A Case of Constructive Cooperation

We are pleased to reproduce in TREES a splendid letter from a subscriber in response to an "Along-the-Way" item in the April issue requesting information on trees that might be infected with the bleeding canker disease. Until receipt of this letter, this disorder was not known to exist in North Carolina, and of course, while it has not been definitely established as such, still judging from the beautiful description given by Mr. F. C. Thomas, Thomas Tree Experts, Greensboro, N. C., the disorder could very easily be *Phytophthora cactorum.*

More of this kind of cooperation should be indulged in by arborists and others. It will serve to better the profession and widen the individual's diagnosis perception. The letter addressed to Mr. Pierre Miller of University of California at Los Angeles, who discussed this disease at the recent Western Shade Tree Conference, follows:

THOMAS TREE EXPERTS
1310 Marion St.
Greensboro, N. C.

April 18, 1941

Mr. Pierre Miller,
Plant Pathologist,
University of California,
Los Angeles, California.

Dear Sir:

I notice in the March-April issue of TREES that you would like to have a report from arborists relative to their observations of what is described as bleeding canker affecting the genus *Quercus.* I have, during my five years of practice here in Greensboro, observed a serious disease of the White Oak (*Q. alba*), Post Oak (*Q. stellata*) and Black Oak (*Q. velutina*) that no one seems to be able to identify and which I believe may be the one referred to as bleeding canker.

Characteristic symptoms of the disease are small dark brown or black spots along the trunk of the tree. (The color depending on whether or not they are leaking freely). These places may range all the way from one to a dozen or more in number and occur almost anywhere along the lower trunk, in some cases one side of the trunk is affected more than the other, although as a rule the spots are pretty evenly distributed. In relatively rare cases a pocket containing as much

(*Continued on page* 13)

Fastigiate Trees for Park and Street

By MALCOLM A. MILNE, *City Forester, and* JACOB GERLING, *Asst. Supt. of Parks, Rochester, N. Y.*

The original purpose of these articles on upright varieties was to deal entirely with deciduous trees, for their use has been sadly neglected in proportion to their value. However, the authors have been so impressed with specimens of the Columnar Scotch Pine growing in our park system that they feel duty-bound to pass along to others an account of this tree.

COLUMNAR SCOTCH PINE

(*Pinus sylvestris fastigiata*)

Many types of fastigiate, more or less upright conifers, such as numerous varieties of Juniperus and Thuja, are quite well known and widely used in landscaping and horticulture. These plants are largely pyramidal rather than columnar in growth and some of the oriental species are very apt to prove temperamental, excepting under favorable growing conditions in congenial locations. *Pinus sylvestris,* that unusually fast-growing conifer from Scotland, has produced a truly fastigiate varietal form which far exceeds most upright evergreens in ruggedness and hardiness. As the photo shows, this variety of Scotch Pine far surpasses almost all fastigiate forms of conifer in sheer dignity and certainly merits much wider use in city plantings, both public and private.

—*Courtesy Rochester Park Dept.*
Fastigiate form of Scotch Pine in Durand-Eastman Park, Rochester

The leaves, or needles, of this variety are darker, more bluish - green than those of the specie. The branches are strictly fastigiate, closely hugging the trunk, to form a compact, stately column. Because of the fastigiate habit, the underside of many of the needles is exposed outward to give a silvery cast to the color of the tree.

This tree prefers a moist, well drained, sandy-loam soil, although like the parent species, it will do well on poorer sites.

Propagation is by cuttings. One of the rooting chemicals should be used to increase the percentage of successful cuttings and shorten the period between cutting and planting in nursery rows. The trees should be balled and burlapped when transplanted to permanent locations, and kept heavily mulched until they become established. Water during dry weather and make certain the trees do not go into the winter in a dry condition.

—*Photo courtesy Charles W. Colburn*
A fine specimen of the columnar Tulip tree

Columnar Scotch Pine is difficult to obtain, although some of the more forward-looking nurseries are growing it. This stately conifer has tremendous possibilities and should prove very popular in the future. In colder climates it may well become the counterpart of the Italian Cypress.

(*Continued on page* 17)

Trees...

"THE AVENUE OF

By EDWARD H. SCANLON

Sometime you may be privileged to spend a few hours, maybe a few days, in the grandiose glory of a Redwood forest. For that brief communion with God's archangels of the arboreal world, no matter where in this country you may be from—south, north, east—you will ever be thankful if you do just a small part in assuring posterity of even a fleeting moment of exhilaration among these unbelievable giants.

For many years a very sincere group of men associated as the "Save-the-Redwoods League," have carried on a grand campaign to preserve the Redwoods of the northern and central California coastal areas. The guiding genius and driving force of this organization for years has been Mr. Newton B. Drury (now Director of the National Park Service). Under his sure, careful guidance the League with the prestige of some of the finest men and women from all walks of life in America, have set an inspiring record of achievement in perpetuating many Redwood areas as "axe-free" for all time.

This notable work was begun in 1918—since that date over 30,000 acres of Redwoods have been preserved as State Parks. This vast area is valued in excess of $6,000,000.

The reason for the formation of the League came with the realization that redwood logging was rapidly reducing the virgin stands to the point where in not too many years they would be but a memory. The high rate of consumption added to the destructive logging methods were progressing far beyond the regenerative capabilities of the forest.

In a way perhaps we can be thankful for the greed of these destructive loggers because the system gave us a grand chain of State Redwood parks and it gave man an opportunity to redeem the mistakes of fellowmen—exemplified in the Save-the-Redwoods League.

The coast redwood (*Sequoia sempervirens*) occurs principally along the northern California coast as far south as Santa Cruz and extending north a short distance into Oregon. It likes the moist, cool climate of the coast and forms stands that in virgin areas contain the almost fabulous amount of 90,000 to 100,000 board feet to the acre. Compare this with the 10,000 to 25,000 acre board feet of the Loblolly-Shortleaf pine type of the southern states.

Another distinction of this species is

View through the "Avenue of the Giants" in Humboldt County. This tract is pre

OF THE GIANTS"

the claim to being the tallest trees on earth. The "Founders" tree, located in Humboldt State Redwood Park, near Dyerville, Humboldt County, is actually 364 feet high and derives its name from its dedication to the founders of the Save-the-Redwoods League.

According to Rehder (Manual of Cultivated Trees and Shrubs) there are three varieties of *sempervirens*—*S. s. adpressa,* an albino; *S. s. glauca,* with glaucous leaves, and *S. s. pendula,* a fine ornamental of a spreading and weeping nature.

Truly, the history of the Save-the-Redwoods League is one of a continuous record of grand achievements. But, they are modest men and do not consider that they have even scratched the surface. The league wants and needs the support of all Americans who wish to preserve for posterity this finest American heritage. You should join the league and share in its achievements.

is present objective of the Save-the-Redwoods League for purchase as a State Park

American Elm Leads In National Street Tree Survey

It is a high tribute to the adaptability and high regard of its beauty and desirability, that the American Elm (*Ulmus Americana*) has been listed on all but one of the over 200 charts returned in the National Street Tree Survey being conducted by TREES. The lone exception was that chart return by Glenn Garwood, Supt. of Parks, South Pasadena, Calif. This is understandable because of the tropical weather conditions in Southern California under which the American Elm is not altogether happy, although it does very well considering.

Recent chart returns are recorded from the following:

W. O. Edmondson, Univ. of Wyoming, Laramie; W. H. Winship, Supt. of Parks, Elkhart, Ind; W. H. Romine, Supt. of Parks, Davenport, Ia; Ray I. Walker, Chicago Park Dist., Chicago, Ill; George Kuny, Park Dept., Gary, Ind; Perry A. Forman, Landscape Architect, Dearborn, Mich; Armin Thurnher, Supt. of Parks, San Marino, Calif; C. E. Smith, Supt. of Forestry, Detroit, Mich; Al Kay, Com. of Parks, Cheyenne, Wyo; Luther B. Burkett, U. S. Forest Service, Bedford, Ind; Fred H. Lang, State Forester, Little Rock, Ark; Fred C. Owens, Mayor, Columbus, Ind; Harry C. Lowden, Director Water Dept., chart filled in by Prof. C. M. Roberts, Fairmont State Teachers Col., Fairmont, W. Va; Chas. Sallee, Supt. of Parks, Indianapolis, Ind; L. B. Houston, Director of Parks, Dallas, Tex; R. Rife, Supt. of Service, Shaker Heights, Ohio; and Joseph Frisby, Supt. of Parks, Richmond, Ind.

Derris Root: A New Insecticide

By A. E. BADERTSCHER
McCormick & Co., Inc.,
Baltimore, Md.

Derris powder sprays are used for the control of more and more insect pests every year, chiefly because derris powder sprays are only in their infancy, and much is to be learned about them, although if one could bring together all the literature written on derris powder one would have quite a library.

Early in the twenties the United States Department of Agriculture was becoming quite concerned about possible arsenical substitutes; materials that would not leave a poisonous residue on materials, plants or objects sprayed. There was then started an intensive period of research by the Insecticide Division of the United States Department of Agriculture, which brought derris powder from an almost unknown insecticide to the threshold of being a major insecticide during a short period of less than ten years. All this basic research was carried on in Washington under the supervision of Dr. R. C. Roark. During this period of study it was shown that the chief toxic ingredient in derris root powder was rotenone and as a result the active ingredients of derris powder are expressed as "rotenone and other derris resins."

This basic research in Washington was followed by rapid commercial developments. The first derris root shipped to this country was grown wild in the old world tropic. After examining many species of derris root, the species *Derris Elliptica* was found to contain the largest percentage of toxic ingredients. Commercial interests in the old world tropics developed plantations of *Derris Elliptica* to a point where all of the root imported from the Dutch East Indies and the Federated Malay States was cultivated properly and prepared for shipment. During this same time the problem of milling the root was studied in the United States. Today it is possible to find several firms that could probably mill a million pounds of powder during a season. Based on the best knowledge available today it is possible to grind this root so that better than 95% of the powder will pass through a standard 200-mesh screen and 90% will pass through a standard 250 mesh screen. A powder milled this fine will contain more killing particles per pound, and if the powder is to be used as a spray it will not clog a spray nozzle. During this early period of development many derris derivatives were prepared. Many have since made their appearance on the market under proprietary names. Derris extracts may be compounded into products with the proper amount of wetting and spreading agents. In other instances the rotenone has been isolated and is then compounded into a finished useable product. Derris powder is mixed with various types of inert carriers and the finished dusts are extensively used on leafy vegetable crops where it would be impossible to remove a poisonous residue by washing.

To make an extract of the derris root or isolate the rotenone, has a tendency to increase the cost per rotenone unit; therefore wherever it is possible, it is a good economical practice to use the powder prepared from the root either as a dust or as a spray.

Derris powder sprays are of special interest to shade tree men because such a spray will kill many varieties of both sucking and chewing insects. Derris kills chiefly by contact but in many instances it has shown a marked repellent property plus residual effect for a period of from several days to a week. Dr. C. C. Hamilton brought the possibility of a derris powder spray to the attention of shade tree men in his article that appeared in the thirteenth National Shade Tree Conference Proceedings. I believe that this work by Dr. Hamilton has done much to interest shade tree men all over the United States in the possibilities of derris powder sprays.

It has been claimed that a slight acid medium will activate derris or rotenone insecticides. It is also known that derris extractives and rotenone in the diluted form are rapidly decomposed in an alkaline medium. At the same time many practical users have obtained excellent control on many insects when derris powder was used with alkaline fungicides; however in such cases it was found advisable to spray the solution immediately after the ingredients were added to the spray tank.

For average purposes it is advisable to use four pounds of derris powder 4% rotenone to each 100 gallons of water. First mix the amount of derris powder used for one tank of spray to a small amount of water, and permit this paste to stand for about thirty minutes. Then add it to the rest of the water in the spray tank.

Derris products have recently been persed by atomization, for the control of certain forest insects; U.S.D.A. Circ. E1515, November, 1940. The atomizing equipment is described in U.S.D.A. Circ. ET-144, May, 1939.

A very advantageous feature about a derris powder spray is that such a spray *is safe on foliage*. It is no more injurious than plain water. When derris powder is mixed in a spray tank with other insecticides or fungicides, no new compounds are formed that would burn foliage.

A spray consisting of four pounds of derris powder (4% rotenone) and four pounds of wettable sulphur in 100 gallons of water has been found to be an effective method to control spider mites on shrubbery and nursery stock. For the control of certain other pests it is advisable to add a mixture of derris powder and from six to eight pounds of a liquid vegetable oil soap to each 100 gallons of water. Rosin Residue Emulsion is probably the most widely used sticker in derris powder sprays, although other sticker may be satisfactory in many cases.

Shade tree men who do a lot of street and city spraying will find that a derris powder spray will not spot the paint on a house or on an automobile, like inorganic insecticides may. A slight residue that may appear will wash off with water.

The purpose of this discussion is to try to interest those whose business it is to spray shade trees, shrubbery or nursery stock, in using derris powder as a spray for the control of some of the many insect pests that they are called upon to destroy by spraying. Those who have worked with derris powder or rotenone will readily understand that many possibilities along this line have not yet been thought of.

The Father Serra Palm

By PERCY C. BROELL
Superintendent Presidio Park
No. San Diego, Calif.

For more than 100 years the *Phoenix dactylifera* palm growing at the foot of Presidio Park has ranked foremost among San Diego's historic landmarks. Planted in 1769 by Father Junipero Serra, the stately tree is unique in age, appearance and history. Generally acknowledged to be the oldest living date palm in California, it is also probably the oldest tree in the state known to have been planted by man.

The Father Serra Palm in Presidio Park.

The *Phoenix dactylifera* is the palm tree of biblical times, and is found throughout Syria to this day. Essentially tropical in habitat, it is ordinarily of great economic value. Because of the poor quality of the fruit found on Serra Palm, the tree was no doubt a seedling brought from Lower California.

Several years ago the tree was straightened and strengthened, and is now a hardy and fairly straight-trunked specimen of the *P. dactylifera* group. The tall unbranched trunk rises over 75 feet in the air, and is surmounted by a spreading canopy of long and narrow feather-shaped leaves. The foliage is dull green in coloring and of waxy surface appearance.

As far back as 1869 the local newspaper agitated for the preservation of this and a companion palm which has since died. Then as now a favorite beacon in a fast changing land, Serra Palm is cherished for its sentimental association with the renowned Father Serra. Historically, its claim to fame lies in that it marks the meeting place on July 1, 1769, of the four divisions of the Spanish colonial expedition, two of which had come overland from Mexico and two by sea. Also, on this spot were buried the victims of scurvy of that expedition.

An iron fence now surrounds the old palm, and a tablet there describes its history, climaxing its recognized triumphs with the words: "Here began 'El Camino Real,' first trodden by white men when Governor Portola set out for Monterey July 14, 1769." Serra Palm is surely in its rightful place, a kingly tree serving as sentinel on a king's highway.

The Man In the Field Reports

(*Continued from page* 8)

as a tea cup full of brownish black water will be found under the bark.

It is customary with me to chisel the bark back to beyond the infected area, then disinfect and waterproof the wound when treating wounds and infections on most trees. *However, such a procedure won't work* in treating oaks for this unknown disease.

The reason is due to the fact that in attempting to trace out the infected areas, black streaks will be found that extend a considerable distance under what appears to be perfectly healthy bark and apparently form a network that connects all of the leaking spots with one another. Thus an attempt to conscientiously trace out all of the infected tissue would result in the trees being girdled.

Another equally characteristic symptom is a marked dying back of the branch ends. The diseased tree usually lingers on for three or more years before death overtakes it. Each year the dying back is a little more pronounced until finally a crop of sickly foliage is produced which withers during the growing season and the tree dies.

Fertilization seems to have no apparent effect nor does watering. Bark tracings and pruning wounds sometimes show a fair healing for a year or two but usually little or no healing is to be seen. When the tree dies a black appearing something or other that looks quite a bit like tarred felt appears under the outer layers of bark. I have yet to see a tree recover from this trouble and a former Davey foreman of wide experience in tree preservation work who came here from New Jersey to work for me, had never seen the disease before and didn't have any idea what it was or what to do about it.

One thing that causes me to wonder if it can be the bleeding canker, is the absence of the characteristic ridges in the wood that is caused by the alternate healing and dying back as is so well exemplified by the Post Oak bark canker common locally.

If this information is of any interest to you, you are welcome to it, and if you know of any remedy that will effect a cure, I will deeply appreciate it if you will let me know about it.

Very truly yours,
(Signed) F. C. THOMAS

LACE BUG . . . RED SPIDER . . . SCALE INSECTS

Lace Bug: Spray immediately after blooms of azaleas and rhododendrons fall. It is at this time that infestation can be detected by examining both surfaces of the leaves. If infested, the upper surface of the leaf will be discolored; and on the underside of the leaf, the nymphs and adults will be seen feeding.

An ideal spray solution for this pest is composed of:

1 pt. *C.P.O. Liquid* (soap).
1 oz. *Black Leaf* 40.
10 gals. water.

Red Spider: This pest attacks *Spruce, Arborvitae, Hemlock, Juniper* and many varieties of deciduous trees such as *Ash, Elm, Larch, Maple* and *Walnut*. An infestation will cause foliage to become brown and dry. The same spray mixture (as for Lace Bug) applied with heavy pressure will afford a good kill and sprayed plants will not retain objectionable residue as when lime sulphur is used. As there are many generations each year, *repeated sprays at regular intervals* should be applied from *early May to early fall*. The Red Spider becomes very abundant in warm dry atmosphere, and particularly during drought periods.

Lilac Scale, Euonymus Scale, Juniper Scale, Pine Leaf Scale: Although dormant oil sprays are generally satisfactory, it is not always considered good practice to apply miscible oils when plants are covered with young tender foliage. For the grower who did not find time ot apply a dormant spray, the following mixture is excellent:

1 qt. *C.P.O. Liquid* (soap).
1 oz. *Black Leaf* 40.
10 gals. water.

This spray should be applied during the period from May 15 to about June 10.

Use of Instruments

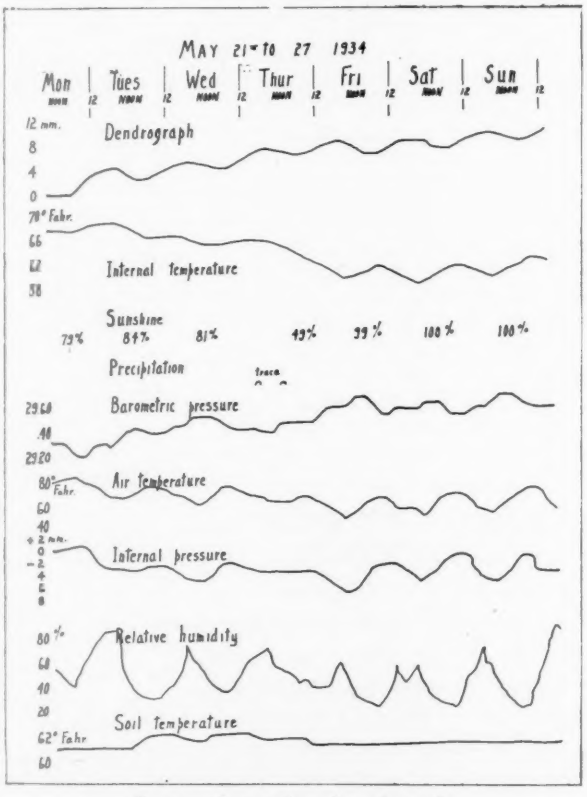
(*Continued from page* 6)

true indication of how "alive" a tree really is.

For some years at the Missouri Botanical Garden continuous and automatic records have been made of ten environmental factors effecting tree growth. The instruments themselves are far too costly and cumbersome for general field use and it will be more interesting to discuss the records obtained than to describe them. Two are of outstanding importance in a study of physiological activity, and therefore they are also important for diagnostic purposes. The first is the *Dendrograph,* which gives a continuous and automatic hourly record of trunk diameter fluctuations. An increase in trunk diameter indicates either growth or water absorption. Shrinkage may be due to water loss in summer or to the extreme cold of winter. There is also a rhythmic diameter change in a normal tree each twenty-four hours, and it is the pattern of this rhythm in which we are interested. The record of the expansion and contraction of the trunk and a record of the internal temperature taken with an automatic thermograph are all that are required for diagnosis. The nearly thirty other instruments used in this work are necessary only for critical work. From these two we are able to designate the hour of complete dormancy in fall and the hour of cambial awakening in spring. Even this cannot be discovered from a superficial examination.

At the present time there are several thousand charts giving an hourly record of the condition of the certain trees for the past seven years, and shorter periods for a number of others. If we examine the behavior of a tree throughout a year we find that the greatest growth takes place between April 10 and June 18. This seems to hold for any species in this section of the country. During this time the "spring wood" is formed and because of the great cambial activity we find that callus growth following surgery is more rapid then than at any other time. This is also the most satisfactory time for feeding. Later in summer the dendrograph shows almost no increase in diameter — the small amount of "summer wood" produced at that time is masked by the water loss. The dormant record is without much interest except for the startling shrinkage when the trunk freezes. There is no indication that the "sap rises" during any particular part of the winter or spring.

The annual internal temperature record shows all the fluctuations of the air temperature during the several seasons. The only exception is that during the growing season the internal temperature is modified by the transpiration stream; while during the winter it shows a lag due to the insulating value of the trunk itself. The lowest winter temperatures are about 8 degrees above the air temperatures and usually occur five hours later than outside the tree. Temperatures during the growing season seldom exceed 86 deg. F., for a normal sound tree, and during seasons of normal rainfall they may be 10 deg. lower. In a dry summer internal temperatures remain below this point until the moisture within the trunk falls below 50 per cent. Any factor—wind, rain, sunshine—which will modify the rate of water loss will also influence the internal temperature.



See text for explanation of graph

An hourly chart taken from a period active spring growth, shows in detail the relationships of the various factors which influence growth. During this week the trunk grew 12 mm. in diameter as shown by the dendrograph. This instrument also recorded the rhythmic diameter changes associated with physiological activity. It will be seen that the trunk is largest at 6 a. m., and smallest at 6 p. m. The shrinking is due to water loss. The normal tree expands and contracts in this manner each day; the actual growth is a smoothed curve of the chart. During the short days of early spring a tree may not begin to decrease in diameter until 9 or 10 a. m. In mid-summer a tree may shrink for fourteen hours and have but ten hours of night in which to re-absorb sufficient water. Thus the "length of day" has a very important bearing on tree growth. During this same week the internal temperature decreased about ten degrees following a rain of .12 inch about midnight Wednesday. It fluctuated but remained somewhat lower indicating that ample water was available for transpiration at this season. Later in summer an abrupt rise usually follows a light rain —this fact is diagnostically important.

Despite the fact that most of us have seen evidence of gas pressure in tree trunks, no investigator (1) has shown that normal tree trunks are ever under pressures differing from that outside the stem. The automatic record shown on the chart indicates that air temperatures have much to do with what "pressure" we find described in the literature.

The chart of October 9 to 15 shows the characteristic behavior of a tree on the threshold of dormancy although it still retains its full quota of leaves. It is

(*Continued on page* 16)

Mook On Planes

(*Continued from page 7*)

growing season advances. The defoliation of such trees may be quite rapid. Oftentimes, especially in top or crown infections, such foliage symptoms may be confined to certain branches. Occasionally, leaves of affected trees may wither suddenly after having developed to full size and color during the earlier part of the season. Foliage symptoms appear more frequently on the London plane than on American plane, but such symptoms may result from causes other than the canker-stain disease. Figure 2 shows a diseased tree nearly defoliated.

By the time foliage symptoms show through most of the crown, the wood-stain phase usually occupies three-fourths or more of the cross sectional area of at least some part of the trunk, the cambium is generally dead around most of the circumference, and the life span of the tree is nearly ended.

Trunk cankers are the most reliable *external symptom* of the disease. In the early stages of the canker there is usually evident an elongate, dark-brown or black discoloration of the smooth bark in line with the grain of the underlying wood. Such areas may become slightly depressed, and the inner bark is dark brown and dead. The dead bark area darkens, dries and cracks, and the central part frequently falls away, exposing the blackened wood surface which becomes dry and often checked. During the first year, the canker is elongate and may be rather narrow, but is commonly 1 to 3 feet in length. Later the cankers widen, often irregularly, and several may grow together. The area between separate cankers is often rounded into ridges, due to the continued growth of the intervening but still unaffected cambium. A well developed trunk canker is seen in Fig. 3.

Miscellaneous rots quickly enter

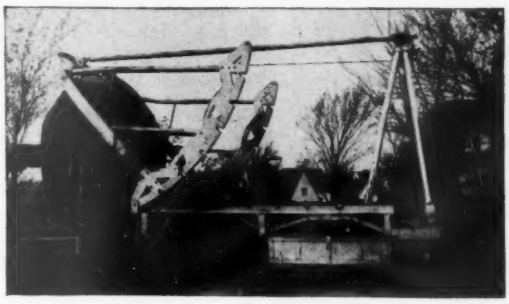
(*Continued on next page*)

Tree Moving

MADE EASY

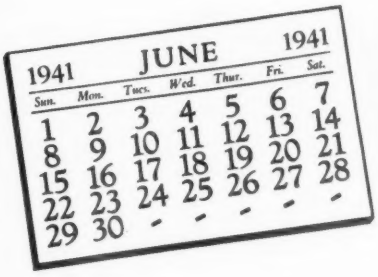
With this Tree Mover you can have speed and economy, plus the flexible feature of removing the superstructure in a few minutes time, leaving your truck usable for other purposes. *We challenge* any one to show how trees up to twelve inches in diameter could be moved better or more economically.

Write for Circulars



WILLIAMS & HARVEY NURSERIES CO.

73rd and Mission Road **Mission, Kansas**



When You Have Trees to Move

Days mean Dollars!

Think of the extra profit if you could extend your planting season through the summer. You can do this easily if you use

REG. U.S. PAT. OFF.

TRANSPLANTONE

THE HORMONE-VITAMIN POWDER

WHEN YOU MOVE TREES OR GENERAL STOCK

Soak the roots with TRANSPLANTONE solution made by dissolving the powder in water. It is instantly soluble. This treatment invigorates the roots so that the tree, shrub or smaller plant can be moved with safety even after foliage has developed.

TRANSPLANTONE reduces wilt and leaf drop—the plant will start right off in its new location with uninterrupted growth. This will lengthen your season many days.

IN THE NURSERY

When you move evergreens, always soak the root ball with TRANSPLANTONE solution. This will develop the root so vigorously that many nurserymen find only one transplanting sufficient to form a big strong ball that will stand shipment for long distances.

TRANSPLANTONE contains Naphthylacetamide, the newest and most widely active plant hormone, vitamins B-1 and C and other growth chemicals. The hormones start roots—the vitamins continue their growth.

SAFE — EFFECTIVE — ECONOMICAL

3 oz. can $1.00 **1 lb. can $4.00**

Buy from your dealer or write to

AMERICAN CHEMICAL PAINT COMPANY

Horticultural Division T-1 **AMBLER, PA.**

Patronize the Advertisers who make "TREES" possible

Use of Instruments

(*Continued from preceding page*)

interesting to note that this is also the record we obtain from a tree which has exhausted its water supply and now requires irrigation. The time of the beginning of expansion and also the beginning of contraction are the same as for early spring because the days are the same length. However, the shrinkage is greater than the expansion during the following night; with the result that the trunk is becoming smaller each day. This would appear to be a poor time for extensive surgery, other than pruning. The effect of rain on the internal temperature of a tree in this condition, or at this season, is altogether different than in spring. From the chart it will be seen that there is a sharp rise following .09 inch of rain—exactly the opposite of the effect we observe in spring. The internal temperature is 22 degrees lower now than the mid-summer maximum, yet its value for diagnosis remains unchanged.

The third chart is from the coldest part of the winter. This period is of special interest since it probably holds a clue to the ejection of cavity fillings and perhaps to other failures of this work which are not so spectacular. At this season a deciduous tree transpires very slightly and so long as the ground remains unfrozen some water will be absorbed, therefore the characteristic rhythm of mid-summer gives way to a pattern changing with the air temperature. Free ice is formed within the trunk at about 19 deg. F. and after this has happened the tree expands or contracts with each change of air temperature. Because of the size of the trunk and its insulating efficiency some five to eight hours elapse before the internal temperature reaches that of the air. Conversely, after the weather moderates, an equal amount of time must elapse before the trunk is warmed to the center. After the trunk is frozen the tree seems to behave as any inanimate object having the same expansion co-efficient—the lower the temperature the smaller the diameter. Frost cracks (3) develop at this time and perhaps many cavity failures can be charged to this same phenomenon since between the colder parts of the winter and the first warmer days of early spring a cavity filling will be alternately very loose and very tight. It must be remembered, however, that the measurements with which we are concerned are nearly microscopic—a matter of a few millimeters; but amply large for the entrance of spores of fungi.

Perhaps too much has been written about charts and temperatures; it may seem impossible to apply similar methods to field work. They have been emphasized because they show that trees are not static structures undergoing a period of growth and another of dormancy, but that trees are dynamic organisms capable of adjustment to even the slightest changes in the environment. They react as fast as any member of the animal kingdom to changing conditions, and the method of diagnosing their troubles must take this into consideration.

The facts uncovered in this study have been put to practical uses. All irrigation, for instance, at the Missouri Botanical Garden, is based upon temperature readings taken from within the trunks of certain key trees. The procedure is not difficult and it is the only precise method which will enable one to outline a corrective program in ample time. As an example of how the charts may be used: We have learned that a temperature of 86 deg. F. is the danger point, and that such temperatures do not occur when there is sufficient water. Therefore, if certain trees give a reading of 70 deg. F. on a morning in July we can be sure that there is a margin of safety—namely the 16 deg. difference. Under continued hot and dry conditions native trees become two degrees warmer each day. Thus the 16 deg. indicates about eight more days may elapse before desiccation reaches the wilting point.

Lest this article be considered too technical, the writer hastens to add that he is not suggesting that handsaws and tools be traded for thermometers and other gadgets. On the contrary these instruments need not be carried about; if there is a simple immersion thermometer available, it might be placed in a bore hole in a tree nearby. It might yield some information and it would prove that trees were very much alive. Some even "run a temperature."

---

(1) Beilmann, August P., An Attempt to Record Internal Tree-Trunk Pressures. Ann. Mo. Bot. Gard. 1940.
(2) Beilmann, August P., Frost Cracks. Bull. Mo. Bot. Gard. March, 1940.

Mook On Planes

(*Continued from page* 15)

through such cankered areas, so that one looking for typical wood discoloration more often finds it beneath the advancing edge of the canker. Cankers of this disease differ from the recently described canker, resulting from gas injury, in not having the bark margins raised and recurved, and they also lack the pink color often present in the proliferated tissue.

The most distinctive symptom of the disease is the *internal* wood discoloration. This wood stain is easily seen in cross sections through cankers (Fig. 4.) The color is a bluish-black to reddish-brown

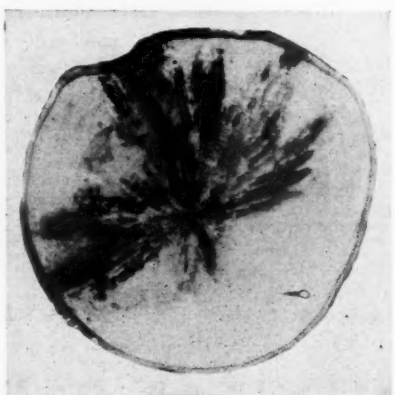


Fig. 4. *Cross section through trunk of a canker-stain affected London plane.*

and is readily seen as irregular, wedge-shaped sectors. The most intense discoloration is in the wood rays. The organism producing the disease grows most rapidly in the ray tissues, oftentimes extending inward to the pith, after which it may grow outward again producing wedge-shaped areas of discoloration in other regions of the stem and cankers at new places on the trunk.

SPREAD OF THE DISEASE

Study of the canker-stain disease has disclosed that spread occurs by wind-blown spores and by man. It is now believed that wind distribution is probably a minor factor in spreading the disease,

(*Continued on page* 18)

Upright Trees

(*Continued from page* 9)

UPRIGHT TULIP-TREE

(*Liriodendron tulipifera pyramidale syn. fastigiata*)

One of the finest trees which thrives in most states east of the Mississippi is the Tulip-tree, often called Yellow Poplar. While this handsome tree does best on the rich, moist soil of woodlands, often supporting its conical head well over 100 feet high on a massive trunk, it can be very successfully grown as a street tree if properly established. Though its brittleness renders Tulip-tree quite susceptible to winter breakage in northern latitudes, it is impervious to most atmospheric impurities of urban centers and is recommended for use in cities where much bituminous coal is burned.

Few city streets are suitable for trees which ultimately attain the proportions of a mature Tulip-tree. Even though this tree would rarely approximate best development in street plantings, we can plant Liriodendron with full confidence that future wide-spreading branches will not prove objectionable. This is accomplished by using *Liriodendron tulipifera pyramidale*, a variety having all the good points of the parent species and yet a more desirable tree for planting in many instances. The acute axils of its branches enable this form to better support the weight of ice or snow and its compact mass waves with the wind, leaving no single, heavy branch exposed to the full fury of a gale.

The leaves and bark of the variety are similar to those of the parent species. The branches are strictly fastigiate, giving the tree a compact, narrowly pyramidal shape.

This tree prefers a moist, well drained, sandy-loam soil. Successful planting on poorer soils is problematical.

Propagation is by grafting or budding onto seedlings of the parent species. Growth is rapid. The trees transplant easily, but should be watered during dry weather and cultivated until they become established.

The most serious insect pest is the tulip-tree scale (*Toumeyella liriodendri*). The scales may become so numerous as to completely encrust twigs and small branches. The winter is spent in the immature stage, the young scales being less than one-sixteenth inch long. Control is by dormant applications of a miscible oil. Certain leaf diseases may become prevalent during wet seasons. Effective control may be obtained by spraying at intervals with bordeaux mixture.

Maintenance cost of the variety is considerably lower than that of the parent species. A little pruning may be necessary to keep the regular outline of the trees. Branching from a point close to the ground should be encouraged in order to obtain the "anchorage" effect necessary with columnar trees.

Upright Tulip-tree is an excellent choice for planting on narrow streets, restricted areas and formal locations. It could well replace the common Lombardy Poplar for many uses. Because the lower branches should not be trimmed off, a wider parking space is necessary for street planting than for some of the other upright varieties. This is truly a beautiful tree which deserves a much more widespread use than heretofore granted it.

"SAVE THAT TREE"
Use THE NEW
DAVIS TREE-TYE
Soft, durable rubber, reinforced with double-strength wove fabric protects life arteries of your trees. All lengths and wire sizes. Practical for trees and shrubs, neat, ECONOMICAL — use many times. Write Garden Equipment Headquarters'.
JOHN BEAN MFG.CO.
339 E. 3rd ST., LOS ANGELES, CALIF.
COLLAR TIE
SPIDER TIE
OPEN TIE

KOPPERSOL

Is An Effective Fungicide Which Will Not Mar Foliage Nor Injure Tree Life

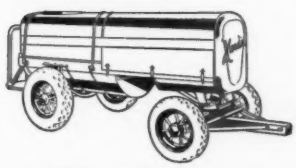
Can be used effectively through the entire growing season; especially recommended for control of Blight and other Fungus diseases on both fruit and shade trees; for Peach Leaf Curl; and for Fungus Brown Patch and Dollar Spot on Lawns and Golf Greens.

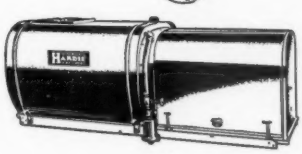
For full particulars write the makers of BORER-SOL and CALSUL

DESTRUXOL Corporation, Ltd.
Pasadena, California

Write for address of your nearest dealer.

● Leading municipalities, tree service men and estate managers prefer Hardie sprayers because the many valuable, exclusive Hardie features of design and construction are available in a very wide range of sizes and styles meeting every individual requirement with an equal measure of dependability and long life. Write for catalog and learn some things you want to know about sprayers. The Hardie Mfg. Company, Hudson, Mich., Portland, Ore., Los Angeles, Calif., New York City.





New spray guns developed by Hardie engineers bring new ease and economy to long distance heavy duty work.

HARDIE *Dependable* **SPRAYERS**
"THE ONLY SPRAY PUMP THAT IS COMPLETELY LUBRICATED"

Authors and Books

The following books may be ordered from TREES Magazine, Box 886, Santa Monica, California.

DWARF TREES, by Shinobu Nozaki. The Sanseido Co., Ltd., Tokyo, Japan. American Agent, G E. Stechert, 31 East 10th, New York City. $4.50.

The 115 full page plates in this very interesting book are a thrill to anyone who loves trees. To see the fantastic but highly artistic forms to which these trees have been trained, makes one want to dig in and try his hand with *Bonsai* (the Japanese term for dwarf trees).

The very detailed cultural directions contained in this book should make many a hobbyist happy in a new pastime.

* * *

HUNGER SIGNS IN CROPS. A Symposium. Edited by Gove Hambidge. Judd & Detweiler, Inc., Florida Avenue and Ekington Place, N. E., Washington, D. C. 340 pp., 79 color plates, 95 halftones. $2.50.

To the arborist, city forester, nurseryman or park superintendent interested in adding to his diagnosis technique this is one of the finest books, and most unique, that has come to this reviewer's attention.

The color plates show various deficiencies in apple, peach, citrus and various farm crops. The plates show the actual color stages of blotching, e.g., plate 7 shows blotching due to magnesium deficiency in apple. Plate 6 shows calcium deficiency.

The text, written by fourteen of the ablest scientists in the United States, is the most comprehensive on food deficiencies and their detection ever printed.

Anyone engaged in any form of park, tree or landscape work that involves plant feeding will find his knowledge increased one hundred per cent through this volume. How they publish this book for $2.50 is a benevolent mystery.

* * *

PRUNING TREES AND SHRUBS, by Dr. E. Porter Felt. Orange Judd Publishing Co., 15 East 26th St., New York City. 237 pp., 94 illus. $2.00.

Dr. Felt has come out with another very worthwhile volume that the professional as well as the layman will find very absorbing and full of valuable information.

The complexities of pruning as it affects different species and types of plants is strongly brought out and lay readers will recognize the mistake of undertaking such a job without sound basic knowledge.

A valuable addition to any tree library.

* * *

FORESTS AND TREES OF THE WESTERN NATIONAL PARKS, by Harold E. and Virginia Long Bailey. U. S. Government Printing Office, Washington, D. C. Conservation Bulletin No. 6. Supt. of Documents. 129 pp., 71 illus. $0.25.

A fine publication by the Dept. of the Interior that gives a complete picture of the trees of all Western National Parks.

An excellent reference for the student of tree lore.

Mook On Planes

(*Continued from page* 16)

especially under city conditions. Both experimental evidence and field observations substantiate this view.

In thickly populated areas, man is by far the most important agency in the spread of the disease. Evidence at hand indicates that the pathogen of the disease may be spread on pruning tools, such as saws, ropes, axes and knives, and by wound dressings. The type of wound through which the fungus enters a healthy tree need only be a very shallow one which merely breaks through the outer part of the bark. However, any wound which reaches to or into the wood may serve as an entrance point for the fungus.

The spread and production of new infections through wound dressings is especially interesting. Usually, one considers a wound dressing as not only affording a protective coat for a recently pruned branch wound, but also an antiseptic. Laboratory and field tests reveal, however, that the fungus causing canker-stain can live for various periods of time in most brands of fresh commercial wound dressings, and that these same wound dressings may become contaminated with infected sawdust which may start new infections. Because of the importance of wound dressings in relation to the spread of the disease, one of the major objectives in work on this disease is now the development of an adequate and truly antiseptic wound dressing.

Fig. 2. *Badly diseased London plane from the Philadelphia area. Trees nearly dead often, but not always, show abundant basal suckers.*

AIDS IN PREVENTING AND CONTROLLING THE DISEASE

From the present state of our knowledge it seems that the menace of this disease can be lessened materially by applying the following recommendations when working on planetrees:

1. Disinfection of all tools used in pruning and line clearance work. Immersion or washing in denatured alcohol has proven satisfactory in this respect.

2. Prompt removal of infected trees. Careful sanitation work is bound to be beneficial. Diseased trees, if left standing, provide a constant source of inoculum for new infections and, at least in the case of London planes, no diseased trees have ever been known to recover from the disease.

3. Until a suitable antiseptic wound dressing is found, avoid getting infected sawdust in paint cans. If wood stain is noted while working on trees, do not paint such wounds; or, if painted, discard the brushes and paints after use.

4. Inspect nursery trees carefully for the disease. To date, we believe that nursery stock has not constituted an important means of spread, although one case of an infected tree has been located in a nursery.

5. Handle trees carefully to avoid wounding them. This is important, as a shallow wound which only breaks through the outer part of the bark may be the place the fungus gains entrance into the tree.

6. Watch your planes for any signs of the disease. Note especially the vicinity of wounds, particularly pruning wounds, for often such places serve as entrance points for the fungus.

In conclusion, information and specimens are desired from suspected planes, especially from locations outside of the known range of the disease. A desirable type of specimen would be a small block of fresh wood approximately 4 inches in length, 2 or 3 inches wide, at least 1 inch thick, and containing some of the bluish-black discoloration, preferably taken from the edge of the canker. Such specimens should be sent to your State Agricultural Experiment Station or to Forest Pathology Field Laboratory, 8 Whippany Road, Morristown, N. J.

Tre-Tonic

IS GIVING

Astonishing Results

when used on

CHLOROTIC TREES

Recommended Method of Soil Fertilization

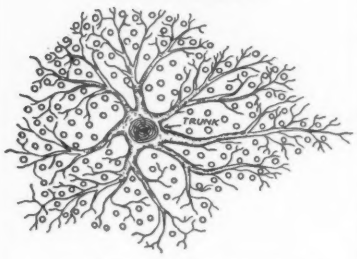


Diagram of Root System

Gaviota TRE-TONIC is a special product of one of the nation's oldest fertilizer houses. Offered for the first time to the horticultural field through TREES Magazine. Users have found it gives amazing results in feeding deficient trees. 80% of TRE-TONIC is a 6-10-6 combination. The other 20% contains minor elements absent in chlorosis.

Try TRE-TONIC Today!

PACIFIC GUANO CO.

4522 Worth St. Los Angeles, Calif.

PROTECT your SHADE TREES

DO IT with ARBOROL Shade Tree Spray...a contact insecticide spray for use against Scale, Mealybugs, Red Spiders, and the eggs of certain other insect pests. "ARBOROL" is also a carrier for fungicides and other insecticides. Write for free folder..."Shade Tree Pest Control with 'ARBOROL'."

CALIFORNIA SPRAY-CHEMICAL CORPORATION

"The ORTHO Company"

Richmond Fresno Lindsay Sacramento
San Jose Watsonville Whittier Anaheim
Chula Vista Pomona Redlands
Yakima & Wenatchee, Wash. Orlando, Fla.
Elizabeth, N. J. Kansas City, Mo.

Leonard Coates Nurseries

Incorporated
Established 1878

●

Growers and Distributors of

Superior Quality

Nursery Stock

San Jose, Calif.

Ray D. Hartman, Pres. & Mgr.

TREE SURGERY
SUPPLIES

●

PRUNING EQUIPMENT
BRACING MATERIALS
CAVITY TOOLS
ANTISEPTIC COMPOUNDS

●

A Complete Line
Write for 96 Page Catalog

A. M. LEONARD & SON
PIQUA, OHIO
Established 1885

SPECIAL RATES
TO
CONFERENCE GUESTS

★

YOUR EARLY
RESERVATION
IS RECOMMENDED

Welcome to
Washington's Finest Hotel

Headquarters for the Seventeenth

NATIONAL SHADE TREE CONFERENCE

August 26, 27, 28 and 29, 1941

● Noted as the residence of celebrated personages and the scene of internationally important events ● Convenient to all Government departments and other points of interest in the Nation's Capital ● World-famous food ● Exclusive Men's Bar ● Coffee Shop ● Gay Cocktail Lounge

The Air Conditioned
MAYFLOWER
WASHINGTON, D. C.
C. J. MACK, *General Manager*

Section 562 P. L. and R.
U. S. POSTAGE
Paid
Santa Monica, Calif.
Permit No. 158

A Profitable and Efficacious Service for Arborists and Nurserymen

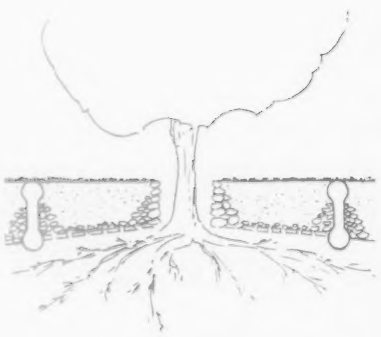
A NEW TREE PRESERVATION PRACTICE

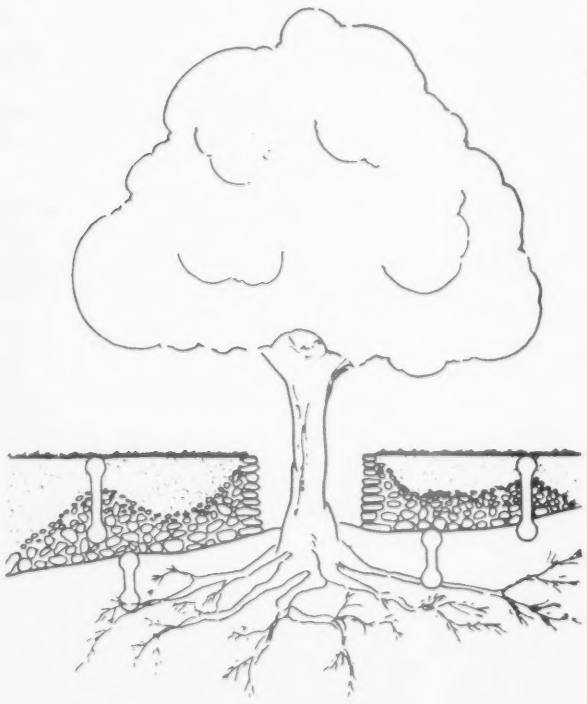
Install TREE BELLS

In Grade Changes of Important Trees

They **do not fill up** with dirt and debris like the **old fashioned** tile—also, open holes in a lawn are **dangerous.** TREE BELLS are a **modern** addition to Tree Preservation practice. They are **porous, completely enclosed** and cheap, because they involve **no future maintenance.**

The Bells serve many other purposes in Tree Preservation service. (1) In planting new street trees to assure deep watering and deep rooting. (2) In feeding trees on lawns to assure dissolution of fertilizer and also watering through turf. (3) In Boxing and Balling specimen trees they guarantee water in the heart of the all important root system centered in the ball.





Park Departments—Arborists—Nurserymen

A PROVEN PRODUCT

Airqua Tree Bell Co.

114 Santa Monica Blvd. Santa Monica, Calif.

Manufacturing and Distributing Rights Available in the East